Enacting Flow and Student Engagement in the College Classroom

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Flow is a peak mental state of full immersion in an activity, characterized by a feeling of energized focus, full involvement, and enjoyment in the process (Csikszentmihalyi, 1990, 1997). In flow, one has the feeling of doing the activity well or being successful at it. Emotions are positive and energized, as with joy, rapture, or intense enjoyment, even though happiness or fulfillment is frequently reported only in retrospect since individuals in flow are usually too focused to form larger meanings of the experience at the time. Flow is a central construct in positive psychology, and is considered one of the main paths to happiness (Seligman, Steen, Park, & Peterson, 2005). There has been a fair amount of research on flow, its various applications, and its associations with a variety of psychological benefits (see Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005; Strati, Shernoff, & Rackar, 2012). Despite the recognized value of flow for one’s quality of life, there have been very few interventions attempting to facilitate it as there have been for many other positive psychological constructs such as optimism, gratitude, and hope. In this chapter, we will briefly review research on flow in education – one of the few settings in which flow has been deliberately induced – including those studies that attempt to facilitate flow in domain-specific instruction. We then present an original study in which we attempted to teach, enact, and stimulate flow in undergraduate classrooms, interpret the results, and identify implications for fostering flow.

Flow Theory and Student Engagement

While flow is typically described holistically as a singular experience with certain psychological characteristics (Csikszentmihalyi, 1990), we find it conceptually useful to distinguish between the experience of and the conditions for flow.

As described above, the experience of flow is characterized by deep immersion and positive emotions, but it also includes a perception of being in control, loss of self-consciousness, and a distorted perception of time (usually time seems to fly) (Csikszentmihalyi et al., 2005; Strati et al., 2012). However, certain conditions make flow experiences more likely. Perhaps the most central criterion for flow to occur is an activity that presents a significant challenge paired with a high degree of skill that can be used to meet the challenge. In addition, flow is more typical when the activity is autotelic, or pursued as a goal in and of itself, and when the emphasis is more on the process than the product. Lastly, flow occurs most often in situations when individuals have clear goals, receives immediate feedback on their progress towards those goals, and feels both autonomous and in control.

Flow is inherently related to learning, because in the process of developing one’s talents and gaining skills, one needs to continually increase the level of challenge to hold one’s interest; further skills are then needed to meet increasingly higher levels of challenge. In this iterative process, both skills and challenges will repeatedly be maximized, and individuals are most likely to enter flow when this occurs. In addition, while facts and rudimentary knowledge may be learned through language and memorization, the learning of most domain-based skills and talents is episodic, characterized by engagement in activities involving motion, rhythm, action, and use of material objects (Shernoff, 2013). We have therefore conceptualized and measured engagement in learning as rooted in the experience of flow, measuring it as the simultaneous occurrence of high concentration, enjoyment, and interest – all experiential components research has shown to be related to learning (Shernoff & Csikszentmihalyi, 2009).

Research on Flow in Educational Settings

Much of the research on flow in educational settings has used the Experience Sampling Method (ESM) in which moment-by-moment snapshots of subjective experience are obtained when participants respond to random signaling prompting them to complete a brief self-report form (Hektom, Schmidt, & Csikszentmihalyi, 2007). In addition to the participants’ experience, the survey also solicits information about the environment such as activities and social partners. A repeated finding of ESM research in educational settings is that flow and engagement in learning vary by activity type. For example, studies have found that students reported higher levels of flow and were more engaged in cooperative group work and individual work compared to whole class or large group instruction in both secondary and higher education (Peterson & Miller, 2004; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003).

Recent studies of optimal learning environments have examined the environmental features of classrooms and other educational contexts empirically shown to produce high levels of engagement and/or flow (Shernoff, 2012; Shernoff, Tombs, Anderson, & Dortch, 2011). While most of these studies are
correlational, the logical implication is that features of the learning environment give rise to heightened engagement or flow rather than vice versa. The most distinctive characteristic of optimal learning environments is environmental complexity, which combines environmental challenge and environmental support. Features of environmental challenge include challenging tasks, clear goals, perceived relevance, and high expectations, use of domain-specific tools to solve problems or fashion products, and accountability/assessments. Another distinctive characteristic of optimal learning environments is environmental support. Environmental support includes motivational/autonomy support, supportive relations, interactivity, performance feedback, and activity level. While some of these studies were based in traditional classrooms, models of optimal learning environments were found mainly in private or alternative public schools (Shernoff, 2015). For example, Rathunde and Csikszentmihalyi (2005a, 2005b) found that students (n = 290) attending Montessori high schools, which integrate freedom of activity choice (environmental supports) with high developmental demands, reported more positive perceptions and emotions while at school compared to students in traditional public high schools. Similarly, students (n = 80) attending the alternative and democratically governed Nova High School in Seattle, Washington, which promotes egalitarian relationships and creates a community climate of mutual respect, involvement, and fairness, were found to be more engaged than those attending a traditional public school (Johnson, 2008).

ESM research has generally found that adolescent-aged students are more engaged during extra-curriculum activities than they are when doing school work (Csikszentmihalyi & Larson, 1984), and when in non-academic classes compared to their academic classes (Shernoff et al., 2003). Adolescents report especially high levels of engagement in structured after-school programs (Vandell et al., 2005). When in such programs, students reported more positively valenced affective states during structured learning activities such as academic and arts enrichment compared to during academic homework (Shernoff & Vandell, 2007). It appeared that students became highly engaged in learning during activities in which they played an authentic role in activities that had meaning or value in real life, and were not perceived as merely academic exercises. Therefore, in our study to facilitate flow in higher education presented in this chapter, we tested the hypothesis that engagement in learning may be maximized in activities that are project-based, set in the real life of the community, and relevant to the lives of youth.

Toward Interventions to Facilitate Flow and Engagement in Learning

Only a small handful of studies of educational contexts attempt to implement a program, curriculum, or intervention specifically designed to elevate flow. However, several recent studies have attempted to implement domain-specific curricular innovations in an effort to stimulate flow and engagement in learning in high school classrooms. We here review one in the context of science instruction and one in English instruction.

As modeled by Larson (2011), an engaging approach to high school science is a curriculum and instruction that is "backward designed" (Wiggins & McTighe, 2005) to develop interest in working towards a real-world learning goal and to sustain engagement as scientific language and vocabulary improve. Backward design is designing instruction with the educational "ends" in mind, as when identifying the educational goals and specific understandings desired before selecting the instructional method and mode of assessment. In this case, the educational ends were to facilitate and sustain engagement, as well as to build science literacy in biology.

Larson (2011) designed a mixed-methods, quasi-experimental study comparing student engagement and conceptual science understanding among students receiving her backward-designed science curriculum intervention to a control group receiving traditional instruction. The curricular intervention emphasized academic literacy instruction. Academic literacy is fluency with modes of inquiry, expression, and discourse in common across core subjects, such as making a hypothesis or supporting an argument with evidence. The intervention utilized four steps or cumulative stages of engaging instruction including (a) situating scientific inquiry to make it relevant to the lives of students (e.g., beginning a unit on germs and disease by dispensing Glo Germ into students' hands and observing the germs after rounds of hand washing); (b) sustaining interest and engagement for the continued construction of scientific knowledge (e.g., activities to simulate a pandemic); (c) supporting autonomy to synthesize knowledge (e.g., making available a wide variety of related reading materials to be explored voluntarily); and (d) student demonstration of scientific knowledge and literacy (e.g., writing an essay contextualized in real-life products such as an article for the school newspaper, serving as a primary assessment of conceptual knowledge and vocabulary).

To assess engagement and learning, Larson used the ESM and authentic learning measures such as science essays in response to a writing prompt, scored with the Illinois state ISAT Writing Rubric aligned with the Illinois Learning Standards. Results indicated that students were significantly more engaged, and obtained significantly higher scientific literacy, reasoned thought, and conceptual understanding compared to a control group using traditional instruction, with high effect sizes (Larson, 2011).

Curricular innovations in English to facilitate a deeper absorption and interaction with literature have been modeled by Wilhelm (2008), by using a methodology similar to the ESM, allowing William to obtain repeated snapshots of students' experiences while reading literature. Wilhelm found that proficient readers experientially enter a story, form powerful mental images, and deeply relate to the characters when reading literature; such readers usually proceed to develop higher-level interpretive and reflective skills. Other readers, however, are resistant to high-level engagement while reading, and have difficulty visualizing or participating in the story world (Wilhelm, 2008). Particularly to help this latter
group, Wilhelm developed several innovative and engaging approaches to English and literacy instruction based in drama and the arts. Activities to help students experimentally enter the story world and progress to more advanced skills included revolving role dramas (taking turns acting out particular scenes paralleling the text), dramatic play (improvisational acting to fill out expected action following a prompt from the story), and guided imagery (writing about or drawing scenes, often guided by visual descriptions or musical accompaniments). Like many effective instructors, Wilhelm considered his students’ deep engagement with content materials to be his primary marker of success. As students participated in these activities, reluctant readers began to make the same moves as the engaged readers in terms of entering story worlds, becoming connected to the characters and authors, and reflecting on their meanings contained in the text.

There has been even less research reported on flow or engagement in higher education than there has been in the secondary and elementary levels. One exception was a unique curricular intervention in which an educational video game was designed to teach an undergraduate course in mechanical engineering (Coller, Sherhoff, & Strati, 2011). Coller designed a new way to teach the challenging mechanical engineering course, Dynamic Systems and Control. Instead of using the traditional approach based on problem sets from a textbook, Coller centered the course on an educational video game in which students raced a virtual car around a track for all of their lab exercises and homework. Specifically designed to plunge students into deep flow with the virtual world of racing, the program demanded that students employ relevant principles of mechanical engineering in order to race the car well. Coller and colleagues performed a quasi-experimental ESM study comparing student engagement and performance of a cohort of students receiving this experimental intervention to that of a control cohort taking the course as it had traditionally been taught. Results revealed that students in the experimental cohort reported significantly greater flow-like engagement, intrinsic motivation, positive affect, and creativity than the students who completed their coursework in the traditional way.

The Study

The present study sought to isolate and measure various flow conditions as well as the effects of specific activity types during multiple class meetings of two consecutive semesters of an undergraduate educational psychology course (Adolescent Development). The first was a unit on flow and student engagement in order to test whether students could experience flow firsthand while learning about it conceptually. The rationale was that when teaching some educational concepts such as flow, it may be extremely important for instruction to “walk the talk,” or enact rather than merely teach the concept. In the subsequent semester, data were gathered in a service-learning class project centered on learning about and creating a community service student organization on campus. This part of the study was to test if students experience flow and student engagement more readily in project-based instruction that focuses on real-life events with real consequences outside of the classroom. The following research questions were examined:

Research Question 1. Would students’ engagement and other experiential variables vary as they moved from one activity to another during a unit on flow in which undergraduate students participated in the ESM? In particular, would students perceive conditions for flow such as challenge and skill, as well as student engagement, to be higher in activities designed to create flow conditions and stimulate engagement?

Research Question 2. Would instructional activities during a service-learning class project in the subsequent semester produce an increase in engagement and other experiential measures compared to the previous semester due to basing activities on issues, events, and outcomes in the “real world”? Which activities produced the highest and lowest engagement across both semesters? Would participants find a project oriented towards community service and social change meaningful?

Method

Participants Participants (n = 54) were undergraduate students enrolled in two consecutive semesters of an undergraduate educational psychology course at a Midwestern university located in a rural, middle-class community. Half of the students (n = 27) were enrolled in the fall 2010 semester, and half (n = 27) were enrolled in the same course in the spring 2011 semester. The gender and ethnic breakdown was similar in both classes: 89% of the sample (n = 24 in the fall and n = 24 in the spring) were female; 68% (n = 17 in the fall and n = 20 in the spring) were Caucasian; 26% (n = 8 in the fall and n = 6 in the spring) were African American; and 6% (n = 2 in the fall and n = 1 in the spring) were Latino. Teacher participants included a Caucasian, male instructor (first author), and three teacher’s assistants (TAs): a Caucasian, male graduate student (second author) in the fall semester, and two female undergraduate students in the spring semester, one Caucasian and one Latino.

Procedures

Instrumentation To introduce students to the principal research method for studying flow, and in the process facilitate an awareness of their own emotional fluctuations, students participated in the Experience Sampling Method (or ESM; see Hektner et al., 2007). Students were signaled at one random time point during each of a variety of instructional activities during a designated unit in each semester, described in more detail below. When signaled, students completed an Experience Sampling Form (ESF) on which they rated their perception of the
activity and subjective experiences on seven 5-point Likert-type scales ranging from “Not at all” to “Very much.” The seven items were: (a) “How important was this activity to you and your future goals?” (b) “Was it interesting?” (c) “Was it challenging!” (d) “Did you enjoy what you were doing?” (e) “How hard were you concentrating?” (f) “Were you using a high level of skill?” and (g) “How much were you learning?” Repeated responses to these items were then utilized as the primary dependent measures of student engagement, flow conditions, and perceived learning. Student engagement was a composite of the items measuring concentration, interest, and enjoyment used in previous research (see Shernoff & Csikszentmihalyi, 2009) reaching an acceptable level of reliability (α = .77). Items measuring challenge and skills were the primary conditions for flow measured. The measure of perceived learning was item (g).

Units and activities Units in both semesters included a variety of activity types, which unfolded over the course of multiple class meetings. See Table 11.1 for a description of each activity. To provide a more in-depth example, a detailed description of the flow application intervention tested in the fall semester is provided below.

Activity 9 (Fall, class meeting 2) - Flow application intervention. The overarching objective of the flow application intervention was for students in small groups to design an activity to foster flow in a given context with a specific population. This was designed as an opportunity not only for students to apply the concept of flow to a real-world context, but also to practice designing and creating the conditions that allow youth to experience flow as future educators. The activity took approximately 35–45 minutes.

First, the classroom was divided into five groups of five or six students. Each group received a packet of materials. Students followed along as instructions were provided orally. For each small group, the Instruction Sheet specified a different, unique population and context for which the group was to design a flow-inducing activity. Example populations included high school students, middle school students, middle school girls, and late adolescents (e.g., ages 17–22); examples of contexts included an after-school club, an art class, a mentoring program to promote resiliency and leadership, a civic action program to promote citizenship and awareness of societal issues, and a computer science class.

The rest of the Instruction Sheet, which was the same for all groups, further directed each small group to identify and describe (a) an activity, (b) defining rules of the activity, (c) instructions for the population, (d) the goals of the activity, and (e) how the group will know if the activity indeed facilitated flow (i.e., method of evaluation). Each student in a group was responsible for describing one of these components on an Activity Structure Worksheet by the end of the activity. In addition, each student was assigned a Specialist Role to be responsible for asuring one of the flow conditions was present in the design of the activity, and described how this responsibility was met in writing.

Table 11.1 Description of activities during the fall and spring semester

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<thead>
<tr>
<th>Fall semester, class meeting 1</th>
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<tr>
<td>Activity 1 Final paper instructions</td>
<td>Instructions for the final paper in the course were distributed and explained orally by the instructor. Students could ask questions.</td>
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<tr>
<td>Activity 2 Cognitive constructivism video</td>
<td>Students watched a video demonstrating principles of Piaget’s cognitive constructivism via a double-digit subtraction task.</td>
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<tr>
<td>Activity 3 Structured cognitive constructivism video</td>
<td>The video was used to provide students with a structured note recording sheet to identify principles of cognitive constructivism depicted in the video.</td>
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<td>Activity 4 Flow presentation and small group discussion</td>
<td>Following a 12-minute PowerPoint presentation describing the experience of flow, students broke into small groups or pairs to share times that they felt like they were in flow.</td>
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<td>Activity 5 Large group discussion on flow</td>
<td>Large group activity to share experiences discussed in Activity 4.</td>
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<tr>
<td>Activity 6 Flow states presentation</td>
<td>Continuation of PowerPoint presentation focusing on conditions for flow states. Students were given a handout with a 2 x 2 chart of high/low challenge and skill conditions, and were asked to complete the psychological state predicted by flow theory (Csikszentmihalyi, 1997) for each combination, providing an example.</td>
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Fall semester, class meeting 2

Activity 7 Class discussion on reading
Class discussion about a reading assignment on “Flow in Schools” (Shernoff & Csikszentmihalyi, 2009), in which the instructor and TA facilitated guided questions.

Activity 8 Written reflection
Written reflections about the flow unit and students’ experience participating in the ESM. Students wrote answers to the following three questions: (a) “What did you learn about flow, or flow in the life of adolescents, that was most valuable?” (b) “Do you think that the ESM (i.e., beeper) method accurately captured your level of flow and engagement over the course of the unit? Why or why not?” and (c) “Would there be a better way? If so, what?” High-challenge task, requiring reflection, independent thinking, and written expression skills.

Activity 9 Flow application intervention
Students in small groups design an activity to foster flow in a given context with a specific population.

Activity 10 Presentation of data
Presentation of research findings on adolescents’ quality of experience as measured by the ESM (e.g., high flow activities and low flow activities) from the previous studies. Being adolescent (Csikszentmihalyi & Larson, 1984) and Becoming adult (Csikszentmihalyi & Schonberger, 2000).

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Table 11.1 (Continued)

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<th>Spring semester, class meeting 1</th>
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<td>Activity 11 Icebreaker</td>
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| The first three activities in the first class of the group project were ice-breaking activities from PeaceJam's service-learning curriculum. In the first activity, students were to stand up if read aloud statements applied to them ("Please stand if ... "). Example statements were, "You have felt it is not always safe in the neighborhood around your schools," "Someone has threatened you personally in the last three years," "Someone you know personally has been in a situation where a knife was used in a threatening way," and, "... where a gun was used in a threatening way." Follow-up discussion questions included, "What did you notice from our pattern of standing up?" "What does this tell you about our own lives?" and, "How do you think teenagers in other parts of the country or world would respond to these categories?"

Activity 12 Role-playing
| Role-played issues of social inclusion and exclusion. Eight volunteers were taken, with one volunteer asked to leave the room. The remaining volunteers were told that they formed a group of friends, and should stand in a circle with their arms around each other's shoulders, much like a sports huddle. After returning to the room, the solitary volunteer played the role of an "outsider," and was told to try to enter the group using any verbal means possible in three consecutive role-plays:
| Role-play 1 – the group of "friends" were asked to be exclusive, keeping their backs to the outsider and keeping the outsider on the outside.
| Role-play 2 – the group of friends were asked to let the outsider inside physically, and put their arms around his shoulders too, but to ignore him and change the topic whenever he tried to speak.
| Role-play 3 – the group of friends were asked to include the outsider in the group, and to make him feel welcomed. Discussion questions were asked after each role-play, such as, "Why do people discriminate against other people?"

Activity 13 Reflection
| This activity was intended to help students reflect on behavioral choices we and others make. Students were broken into groups of six or seven students. They were then provided with descriptions of five basic human needs according to psychiatrist, Dr William Glasser: survival, love and belonging, power, freedom, and fun. They were then asked to explore two scenarios, one in which a young person steals a car, and another in which a young person joins a gang. After each scenario, students were asked how the action might have been done to satisfy each of the needs (e.g., "How could the car theft have helped to meet the need for survival?"). Following consideration of the two scenarios, students proceeded to engage in small group discussions with discussion questions such as, "Does this tell us anything about the possible roots of violence? What?"

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<th>Spring semester, class meeting 2</th>
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<td>Activity 14 View our testimonials</td>
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<td>Students were introduced to the PeaceJam organization, including its history and mission, how it operates, and its impact on the development of participants. In this activity, students watched a video of testimonials from PeaceJam participants about how participation impacted them personally and their development as an individual.</td>
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Activity 15 Book reading and presentation |
| Following an assignment in which each student read a chapter from a book on PeaceJam's 10 "Global Calls to Action" about a youth who interacted with a Nobel Peace Laureate in service of that call, all students made a class presentation of what they had learned from the chapter they had read. |

Activity 16 Service phase of project |
| Following the first phase of the project in which students were educated about PeaceJam, its potential impact on adolescents, and social issues it is intended to address, the service phase of the project began in which the class was intended to "spring into action." The instructor presented plans for forming a PeaceJam Scholars student organization and the class began to discuss strategies for outreach and recruitment. |

Activity 17 Class brainstorm |
| This was a whole class brainstorming activity on strategies for the PeaceJam club recruitment and outreach, and possibilities for division of labor. |

Spring semester, class meeting 3 |
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<td>Activity 18 Small group applications</td>
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<td>Students worked in small groups to complete a part of the student organization's application to the University's Student Association. This included the writing of a mission statement, a constitution with bylaws according to a template, and election procedures.</td>
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Spring semester, class meeting 4 |
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<td>Activity 19 Small group discussion</td>
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<td>This was a small group activity to discuss outreach activities and division of labor. At the time of the signal, students were reading instructions at the beginning of the activity.</td>
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Activities 20 and 21 Small group discussion 2 and 3 |
| Following the reading of instructions, students worked in small groups to discuss strategies for communicating with other classes and organizations; media strategies including print media (e.g., campus newspapers and internet articles), radio, college publications, and social networking outlets; and strategies for making and distributing materials such as flyers and signs. |

Spring semester, class meeting 5 |
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<td>Activity 22 Small group promotional activity</td>
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<td>Students worked in small groups to make promotional materials using computer design programs. They were given significant latitude to create promotional materials of interest.</td>
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<th>Spring semester, class meeting 6</th>
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<tr>
<td>Activities 24 and 25</td>
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<tr>
<td>Small group promotional activity 2</td>
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<tr>
<td>Students continued work on promotional materials and all students were to complete at least one flyer either independently or as part of a team. Instructions indicated that the best or most creative flyers according to a panel of the PeaceJam Scholars officers (who had now been elected) would be recognized and announced.</td>
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**Qualitative measures of experience (spring)** During the spring semester, students had several opportunities to reflect in writing on the importance of community service to adolescent development and their personal experience with the group project. At the end of the class project, students completed several follow-up measures of experience, including a survey adapted from Jones, Bench, and Warnaar (2010) in which students rated the extent to which their encounter with the class project was meaningful and purposeful on a five-point scale from “agree” to “disagree” (sample items: “Working for social change is personally meaningful”; “Participating in the class project has motivated me to work for social change”). In addition, a focus group of five students participated in a recorded interview soliciting their reflections on the class project. These follow-up measures will be discussed as a complement to the ESM analysis of data presented below.

**Results**

**Statistical analysis** There were 46 student participants who provided at least one of the ESMs (Ntotal = 441) collected. To answer Research Question 1, we employed One-Way ANOVA comparing mean differences in engagement and other experiential variables, and Duncan’s Multiple Range post-hoc tests for significance testing mean differences between activities during the unit on flow. To answer Research Question 2, we conducted a factor and correlational analysis of the experiential items, and examined histograms of experiential items by activity. We also conducted an Independent Samples t-test comparing the mean difference in engagement and other experiential variables between the fall and spring semester at both the activity and person level, and examined a histogram of engagement combining activities from both semesters.

**Findings**

**Preliminary analysis** A factor analysis was conducted to determine what set of experiential variables, if any, were highly intercorrelated with perceived learning and concentration as subjective proxies for learning. Two factors emerged with Eigenvalues greater than 1. Variables loading highly on the first, which accounted for 55% of the variance, included interest (.94), enjoyment (.85), importance (.75), and perceived learning (.74). This factor appeared to represent intrinsic motivation and relevance as highly related to perceived learning in the college classroom. Variables loading highly onto the second factor, accounting for 16% of the variance, were challenge (.98), skills (.85), and concentration (.52). This factor appeared to represent the flow conditions and its theorized relation to concentration. Figure 11.1 illustrates how challenge, skills, and concentration tended to vary together by activity during the unit on flow, with all three heightened during the flow intervention application and the reflective writing activity. The correlation between engagement and perceived learning at the activity level confirmed a moderately high relationship (r = .71, p < .01), which was significant despite an N of only 25 activities. Similarly supportive of the factor analysis, challenge, skills, and concentration had a high intercorrelation at the activity level (a = .84).

**Research Question 1** The overall F-test of the hypothesis of mean differences in engagement among activities during the unit on flow in the fall semester was not significant, F(9,174) = 1.47, ns. Duncan’s post-hoc tests revealed one exception, however: the reflective writing activity (Activity 8) was reported as significantly more engaging than Activities 6 and 10, both of which were direct instruction (PowerPoint presentation on flow conditions, and presentations of findings about flow in the life of adolescents). Also, the F-tests for mean differences in the flow
conditions of challenge and skill were statistically significant, F (9, 174) = 9.90, p < .001; and F (9, 173) = 3.81, p < .001). Post-hoc comparisons revealed challenge was significantly higher in the reflective writing activity and the flow application intervention than in all of the other activities, and skill level was also higher in these activities than in the five activities in the bottom of the skill level distribution. The lowest skill use was reported in Activity 2 (unstructured viewing of the Piaget video), which was significantly lower than not only the writing activity and flow intervention, but also Activity 4 (sharing flow experiences in small groups). The only other experiential item for which the F-test was significant was concentration, F (9, 174) = 5.50, p < .001, with the highest level of concentration also reported in the reflective writing activity and flow application intervention.

**Research Question 2** Results of Independent-Samples t-tests at the activity level (e.g., mean engagement in Activities 1–10 vs. Activities 11–25) reveal that engagement and importance were reported to be significantly higher in the fall semester, t (24) = 2.31, p < .05; and t (24) = 2.12, p < .05, respectively. This indicates that average engagement was actually lower in the service-learning class project activities in the spring than in the fall activities in the fall. Figure 11.2 illustrates mean engagement in all 25 activities from lowest to highest. Here we see engagement was reported to be lower in nearly all of the activities in the spring semester compared to the fall semester with the notable exception of the icebreaker activities to promote awareness and connections around issues of violence and social exclusion (spring activities 11, 12, and 13). Results of t-tests at the student level (e.g., mean engagement of students in the fall vs. students in the spring) yielded higher means among students in the fall (flow unit) for all experiential variables, but none of the differences were statistically significant.

**Qualitative findings** Qualitative data in the form of open-ended reflections, as well as a survey and focus group interview conducted at the end of the semester, were analyzed to assess if students would experience a project oriented towards community service and social change as meaningful. In their reflections, assignments, and interviews most students consistently demonstrated a sound understanding of how community service was of value to adolescent development. Furthermore, survey results indicated that on average students felt that working for social change was important, personally meaningful, and made them feel good about themselves. Of the 21 items in the survey, on average they more strongly agreed than disagreed with the vast majority of positive statements about the meaningfulness of the project. Strongest agreement was expressed with the statement: “I felt like I could give my opinion, or have a voice, in the class project activities”; “It is important for individuals to work for social change”; “Working on social action projects makes me feel competent or successful”; “Working for social change is personally meaningful”; and “Participating in the class project has made me more tolerant of people’s differences.” There were only three of the 21 statements with which students disagreed more than agreed, which were: “Participating in the class project is consistent with my spirituality or religious views”; “Participating in the class project has made me think about my place in the world”; and “I felt connected to my class project groups.”

Perhaps the strongest theme emerging from student reflections and interviews was a high personal regard and appreciation for community service and service learning in general. Many students claimed that this disposition would inspire action on their part to be more involved with community service initiatives now or in the future. The vast majority of the students were open and honest that they lacked the time to be highly involved in the PeaceJam initiative on campus at this juncture in their undergraduate education, but nevertheless saw enough value in it that they hoped the organization would be successful and maintain a presence within the university. Most students also shared their appreciation for a range of values engendered by the class project, including making a difference in the world, helping others, human diversity, empathy and compassion, teamwork to improve one’s community, service-oriented identity development, and making a contribution. They also valued the sense of self-esteem and accomplishment adolescents can gain from making a positive change in one’s life and contributing to “something larger” in the outside world. Several students indicated that the values embodied by the class project influenced their educational and career goals.
Discussion

In this chapter, we presented a study comparing a range of college classroom activities both within and between two consecutive semesters of a college educational psychology course in terms of their association with flow and student engagement. With respect to the within-semester comparison of activities during a unit on flow, highest engagement was reported in a reflective writing activity (Activity 8), and secondarily in a flow application intervention (Activity 9), specifically designed to increase flow and engagement. In these activities, it is likely that conditions for flow were operative. For example, both Activity 8 and Activity 9 were high challenge activities, and students confirmed that this was met with a comparably high level of skill use. Moreover, the flow application intervention was specifically designed to (a) provide a sense of control for students by allowing them to design an original flow activity, (b) provide a clear goal for each student (i.e., through the specification of individual roles and responsibilities), (c) provide a challenge demanding the use of skills, requiring focused concentration, (d) provide feedback to each individual from the supervising instructor as well as student collaborators, (e) solicit a variety of skills (e.g., social, verbal, written) and interests, and (f) foster interactivity. With these most fundamental conditions for flow satisfied, according to the theory, the expectation for students to concentrate the hardest in these activities was also fulfilled. On the other hand, the lowest levels of engagement were reported during unstructured video viewing and teacher presentation on flow and related research findings, among the only activities in which the students were strictly consumers of information transmitted to the whole class and were required to surrender their control almost entirely.

Overall, we found that student engagement and sense of importance were higher in the fall semester than in the spring semester. In fact, lower engagement was reported in nearly every individual classroom activity in the spring with the exception of only the initial icebreaker activities designed to introduce issues of violence and social exclusion. These findings indicate that student engagement was actually lower during the service-learning project than during the unit on flow in the fall.

There may be a number of possible reasons why this was the case. First, it should not escape notice that the units were very different in nature. The explicit goal of the unit in the fall was the teaching and enacting of flow, but the class project in the spring seemingly had nothing to do with flow in terms of context (rather, the focus of the service-learning class project in the spring was on the role of community service in supporting adolescent development). It was of interest to test students' experience of flow given this difference because it may be argued that overly attempting to teach and create flow can have the effect of ironically interfering with the experience of flow, which usually entails unconsciousness. However, results suggested that being conscious about the concept of flow did not detract from the experience of engagement in learning about it; on the contrary, student reflections indicated that they found the topic of flow to be a very novel, interesting, and engaging one.

Although one should not underestimate the potentially confounding influence of cohort effects when comparing results between only two classes, results suggest that the overarching dimension of embedding instruction in a real-life project is not a panacea or "meca-factor" for stimulating engagement, the hypothesis tested in the spring semester. On the contrary, results suggest that the more proximal conditions and intentional designing of these activities may take precedence in terms of potential to engage students. Not only was this illustrated in the case of the very methodically designed flow application intervention, but also in the case of the icebreaker activities in the spring, as these activities were also very thoughtfully designed and structured group activities from PeaceJam's official service-learning curriculum. Both activities were designed to foster connectedness and relationship building.

Findings also invite educators to consider the meaning of "instructional relevance," especially in the college classroom. The two-factor structure appearing to represent intrinsic motivation (i.e., interest, enjoyment, positive affect) on the one hand, and flow on the other (i.e., challenge, skills, concentration), is not at all atypical in ESM research on academic engagement at the secondary and university level (e.g., Coller et al., 2011; Shernoff et al., 2003). In high school classrooms, the perception of importance or instructional relevance in classrooms typically loads more highly onto the flow factor; however, in this sample of college students, it loaded more highly onto the intrinsic motivation factor, along with perceived learning.

Because college students typically adopt a more consumer-oriented approach to course taking, they may enter courses with firm expectations about the relevance for their interests and career goals. Therefore, relevance may be more individualized and topic-based in college than at the secondary or prior levels of education, and may indeed be a strong catalyst for interest and perceived learning. In elementary and secondary instruction, engagement including importance may be more dependent on pedagogy and activity type.

Given the limitations of time (typically limited to course meeting times within a single semester) and space (typically on the college campus) when designing a course for the college classroom, embedding instruction in community projects may be vulnerable to backfiring by virtue of "trying too hard," ironically becoming perceived as more contrived than more traditional, less "ambitious" instruction. It is possible that service-learning projects may need to be student-selected and embedded in students' interests and career goals in order to generate greater engagement. This may prove challenging in mixed-majors undergraduate classrooms, but may stand a better chance of success at the graduate level where interests among students may be more homogeneous.

Despite relatively lower engagement during the service-learning class project in the spring, qualitative data demonstrate that most students found it to be a personally meaningful experience that enhanced their lives or futures. These somewhat
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Overall, the study supports the proposition that optimal learning environments are created by environmental complexity (i.e., a combination of environmental challenge and support), including a variety of environmental conditions that stimulate flow and engagement in learning. These conditions included optimal challenge, a complex task often involving the use of materials, clear and important student goals for the activity, interactivity, and teacher monitoring and feedback, and good rapport between teacher and students (Shernoff et al., 2011). When many of these features are present, students are frequently problem-solving, experimenting, or learning by discovery. To a certain extent, some schools with alternative approaches, such as Montessori schools (Rathunde & Csikszentmihalyi, 2005a, 2005b) and the Nova High School in Seattle (Johnson, 2008), suggest that a large factor in creating optimal learning environments is providing the right kind of environment: one in which the classroom is rich with objects of exploration, time and space for autonomous exploration is provided, and a culture of respectful relationships, belongingness, and participation is sustained. Subject-specific research that has successfully stimulated flow within curricular interventions (e.g., Larson, 2011; Wilhelm, 2008) suggests that optimal learning environments are also created by intentionally or “backward” designing a high level of involvement, interaction, and application of domain-specific language and tools into the instructional activity. The present study corroborates these findings, further suggesting that curricular interventions can stimulate flow and engagement in learning when primary conditions for flow are created, including a clear goal and role for each student and performance feedback on reaching that goal.

Overall, this study illustrated that students could simultaneously (a) learn about the concept of flow, its relation to learning, and how to apply it to create optimal learning environments; (b) gain an understanding of a leading methodology used to study flow and student engagement; and (c) experience heightened engagement during activities in which conditions for flow were present. In addition, the conditions most important for creating flow may be identified and discussed as a class, furthering students’ understanding. In this manner, students not only learn, but also practice positive psychology.


